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PREWAR DEVELOPMENTS IN THE SOVIET HARD ALLOY INDUSTRY

REPLACE COBALT, TUNGSTEN IN NEW ALLOY -- Tsvetnyye Metally, Vol XV, No 5-6,
May-Jun 40

The need for economy in expensive raw materials used in producing metallo-ceramic alloys demands that production of all these alloys be based on domestic raw materials or on the minimum of imported raw materials. The use of titano-tungsten and tantalum or niobium alloys, as well as alloys with nickel and iron bond, instead of tungsten-cobalt, should be expanded. In the ever-increasing output of hard alloys, the saving of tungsten by substituting titanium, niobium and tantalum and substituting nickel (or iron) for cobalt will be of tremendous importance.

Recently, a group headed by Engr V. I. Tret'yakov at the metallo-ceramic laboratory of the Hard Alloys Combine, as the result of work on substituting nickel for cobalt, developed a new tungsten-nickel alloy of the grade Reniks-6 (that is, with 6 percent nickel).

The tests on the cutting properties of this alloy under laboratory and production conditions gave extremely satisfactory results, in comparison with the well-known tungsten-cobalt alloys RE-6 and RE-8.

In tests made at the laboratory of the Hard Alloys Plant, 4x0.79-millimeter cutters made from Reniks-6 showed an increase of 60-minute cutting speed of from 10 to 22 percent over RE-8 in cutting cast iron with a hardness of 183-194 according to Brinell. These results have been fully upheld by comparative tests on Reniks-6 cutters at the Automobile Plant imeni Stalin, Machine-Tool Plant imeni Ordzhonikidze (Moscow), Kaluga Machine-Building Plant, Melitopol' Machine-Building Plant imeni Mikoyan, and others.

All that remains is for the technology of producing this alloy to be adopted in the immediate future in the shops of the hard alloys plant on a scale sufficient to satisfy the demands of industrial enterprises.

A. I. Samokhvalov, Peoples' Commissar of Nonferrous Metallurgy, has ordered the Hard Alloys Combine to organize by 1 June 1940 the production of the Reniks-6 alloys.

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PLANT DEVELOPS NEW HARD ALLOYS -- Tsvetnyye Metally, Vol XV, No 4, Apr 40

In 1939 the hard alloys plant of "Glavredmet" (Main Administration of Rare Metals) made considerable strides forward, with shop No 2 making a particularly substantial gain in the output of titanium alloys. Production of the "Al'fa 15" hard alloy which has a durability several times that of "Al'fa 21" was started.

Specimens of an alloy with a titanium and vanadium carbide base were obtained. It should be noted that tungsten is completely lacking in this alloy. At the end of 1939, the Central Scientific Research Laboratory of the plant produced the first lot of 200 kilograms of the "Reniks" alloy in which nickel replaces cobalt.

In the stellite laboratory of the Central Laboratory, cast hard alloys were developed. One of these, "Sormayt No 2" contains no imported or scarce alloying elements. It has a higher durability and toughness than "Sormayt No 1."

For the first time the laboratories obtained borite cast iron and ferroboration which is used in its production, and the cast cutting alloy KhVM for coating cutters and other tools as a substitute for high-speed tungsten steel. Preliminary tests of the metal have had outstanding results.

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